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TI Epoxy resin compositions and semiconductor devices sealed therewith
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PA Sumitomo Bakelite Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
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LA Japanese
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0 PI JP 11100491 A2 19990413 JP 1997-263954 19970929
AB The compns. comprise (A) .gtoreq.1 epoxy resins selected from multifunctional epoxy resins GOC6H4-mRm[CH[C6H4-n(Rn)OG]C6H3-m(Rm)(OG)]lH (I) and MeC[C6H4-n(Rn)OG]2-p-C6H4CMe2Q1G (R = halo, Cl-12 alkyl; G = glycidyl; Q1= Rn-substituted 1,4-phenylene; l = 1-10; m = 0-3; n = 0-4) and/or cryst. epoxy resins with m.p. 50-150.degree. of 4,4'-biphenol diglycidyl ether, hydroquinone diglycidyl ether, 4,4'-stilbenediol diglycidyl ether, 4,4'-methylenediphenol diglycidyl ether, their halo and/or Cl-12 alkyl derivs., and Q2(CH2-p-C6H4CH2Q3)lH (Q2, Q3 = 4,4'-biphenol diglycidyl ether group, its halo and/or Cl-12 alkyl deriv.; l.= 1-10), (B) phenolic resin curing agents HOC6H4-mRm[CH[C6H4-n(Rn)OH]C6H3-m(Rm)(OH)]lH (II); R, m, n, and l are same as above), (C) curing accelerators, (D) fused SiO2 powders, and (E) Sb2O4 or Sb2O5. Substantially only semiconductor element-mounted side of substrate is sealed with the compns. The semiconductor devices have excellent reliability, storage stability at high temp., and fire resistance. Thus, a compn. of (I) (m, n = 0; Epikote 1032H) 3.8, 3.3', 5,5'-tetramethyl-4,4'-biphenol diglycidyl ether (YX 4000H) 3.8, (II) (m, n = 0; MEH 7500) 4.4, Ph3P 0.2, fused SiO2 85.0, Sb2O4 1.0, brominated epoxy resin (BREN) 1.0, carnauba wax 0.5, and carbon black 0.3 part showed spiral flow 81 cm and was transfer molded to give a ball grid array package showing reduced warpage and good solder heat and thermal shock resistance.

ST epoxy resin semiconductor packaging warpage redn; thermal shock resistance
epoxy resin semiconductor; antimony oxide fireproof epoxy resin semiconductor; solder heat resistance epoxy resin semiconductor
IT Fireproofing agents
(antimony oxides; epoxy resin compns. for semiconductor device packaging with good reliability and storage stability at high temp.)
IT Phenolic resins, uses
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(crosslinking agent; epoxy resin compns. for semiconductor device packaging with good reliability and storage stability at high temp.)
IT Electronic packaging materials
Heat-resistant materials
Semiconductor devices
(epoxy resin compns. for semiconductor device packaging with good reliability and storage stability at high temp.)
IT Phenolic resins, uses
Phenolic resins, uses

TPP
↓ warpage

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14

RL: DEV (Device component use); IMF (Industrial manufacture); POF
(Polymer
in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(epoxy; epoxy resin compns. for semiconductor device packaging with
good reliability and storage stability at high temp.)

IT Epoxy resins, uses
Epoxy resins, uses
RL: DEV (Device component use); IMF (Industrial manufacture); POF
(Polymer
in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(phenolic; epoxy resin compns. for semiconductor device packaging with
good reliability and storage stability at high temp.)

IT Crosslinking agents
(triphenolmethane-type phenolic resins; epoxy resin compns. for
semiconductor device packaging with good reliability and storage
stability at high temp.)

IT **112755-07-4**
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or
reagent); USES (Uses)
(MEH 7500, crosslinking agent; epoxy resin compns. for semiconductor
device packaging with good reliability and storage stability at high
temp.)

IT **174882-88-3P**, Epikote 1032H 223591-58-0P 223591-59-1P
223591-60-4P 223591-61-5P 223591-62-6P 223596-22-3P
RL: DEV (Device component use); IMF (Industrial manufacture); POF
(Polymer
in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(epoxy resin compns. for semiconductor device packaging with good
reliability and storage stability at high temp.)

IT 1314-60-9, Antimony pentoxide 1332-81-6, Antimony tetroxide
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(fireproofing agent; epoxy resin compns. for semiconductor device
packaging with good reliability and storage stability at high temp.)

IT 222053-12-5
RL: DEV (Device component use); POF (Polymer in formulation); PRP
(Properties); USES (Uses)
(phenolic resin-crosslinked; epoxy resin compns. for semiconductor
device packaging with good reliability and storage stability at high
temp.)

IT 60676-86-0, Fused silica
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(with regulated uranium and thorium; epoxy resin compns. for
semiconductor device packaging with good reliability and storage
stability at high temp.)